Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-20 (canceled).

21. (Currently Amended) A method for anisotropically etching structures into a substrate positioned in an etching chamber, comprising:

providing an etching mask on a silicon substrate positioned in the etching chamber; and

providing the etching chamber at least intermittently with an etching gas and at least intermittently with a passivation gas, wherein the passivation gas is supplied to the etching chamber in cycles each having a time period between 0.05 second and 1 second;

wherein the etching gas and the passivation gas are used alternately during separate etching steps and passivation steps that are controlled independently of one another, the passivation gas being supplied to the etching chamber substantially only during the passivation steps, and the etching gas being supplied to the etching chamber substantially only during the etching steps; and the duration of the passivation steps is set to be shorter than the duration of the etching steps by a factor of 10 to 30;

wherein a passivation gas line is provided upstream from the etching chamber, a buffer tank is located along the passivation gas line upstream from the etching chamber, a passivation gas valve is located downstream from the buffer tank and upstream from the etching chamber, and an etching gas line is provided upstream from the etching chamber;

wherein the passivation gas line and the etching gas line one of: a) connect directly into the etching chamber; and b) connect directly into a common feed line upstream from the etching chamber, wherein the common feed line feeds into the etching chamber;

wherein all of the passivation gas supplied to the etching chamber passes through the passivation gas line and the buffer tank.

22. (Previously Presented) The method as recited in Claim 21, wherein the cycles have an identical time period between 0.1 second and 0.5 second.

23. (Previously Presented) The method as recited in Claim 21, wherein the etching gas is also supplied to the etching chamber in cycles each having a time period between 1 second and 15 seconds.

24. (Canceled).

25. (Previously Presented) The method as recited in Claim 21, wherein the passivation gas includes at least one of C_4F_8, C_3F_6, C_4F_6, C_5F_8, and $C_2H_2F_2$.

26. (Previously Presented) The method as recited in Claim 23, wherein the anisotropic etching is performed in separate, sequentially alternating etching and passivation steps, and wherein a Teflon®-like polymer is applied to at least one lateral delimitation of the etched structures with the aid of the passivation gas during the passivation steps, the polymer being at least partially eroded during the etching steps following the passivation steps and being redeposited in lower regions of the etched structures.

27. (Canceled).

28. (Previously Presented) The method as recited in Claim 23, wherein a high-density plasma having at least 10^{12} reactive species/cm^3 is provided for the etching steps, and wherein pulsed ion bombardment of the substrate having an ion energy from 1 eV to 100 eV in one of continuous wave operation and averaged over time is performed at least intermittently during the etching steps.

29. (Previously Presented) The method as recited in Claim 21, wherein the amount of the passivation gas used during each of the individual passivation steps is reduced one of continuously and in steps as etching progresses.

30. (Currently Amended) A plasma system for anisotropically etching structures into a substrate, comprising:

an etching chamber for accommodating the substrate, wherein the substrate is positioned on a substrate electrode located within the etching chamber;

a plasma source for producing a plasma acting on the substrate; and

a supply arrangement for at least intermittently supplying an etching gas and at least intermittently supplying a passivation gas to the etching chamber;

a passivation gas line provided upstream from the etching chamber;

a buffer tank located along the passivation gas line upstream from the etching chamber; ~~and~~

a passivation gas valve located downstream from the buffer tank and upstream from the etching chamber; and

an etching gas line, wherein the passivation gas line and the etching gas line one of: a) connect directly into the etching chamber; and b) connect directly into a common feed line upstream from the etching chamber, wherein the common feed line feeds into the etching chamber;

wherein all of the passivation gas supplied to the etching chamber passes through the passivation gas line and the buffer tank.

31. (Previously Presented) The plasma system as recited in Claim 30, further comprising:

a pump device for evacuating the etching chamber;

wherein the etching gas and the passivation gas are supplied to the etching chamber alternately during separate, independently controlled etching and passivation steps, and wherein a region of the etching chamber where the plasma source acts on the etching gas is substantially free of the passivation gas during the etching steps, and wherein a region of the etching

chamber where the plasma source acts on the passivation gas is substantially free of the etching gas during the passivation steps.

32-33. (Canceled).

34. (Currently Amended) The plasma system as recited in Claim 30, ~~further comprising:~~ wherein

~~an~~ the etching gas line is provided with an etching gas valve for selectively interrupting a supply of the etching gas to the etching chamber before the passivation gas is supplied to the etching chamber.

35. (Previously Presented) The plasma system as recited in Claim 34, wherein at least one of the etching gas valve and the passivation gas valve is positioned at a distance of less than 20 cm upstream from the etching chamber.

36. (Previously Presented) The plasma system as recited in Claim 34, wherein the etching gas valve and the passivation gas valve are combined into one changeover valve for alternately connecting the etching gas line and the passivation gas line to the etching chamber.

37. (Previously Presented) The plasma system as recited in Claim 30, wherein the buffer tank has a volume of 0.1 L to 1 L.

38. (Currently Amended) The plasma system as recited in Claim ~~32~~ 30, wherein the plasma source is an inductively coupled plasma source, and wherein the etching chamber has an internal diameter of 5 cm to 20 cm at least in a region near the plasma source, whereby when the plasma source is powered by a high-voltage generator, a power per area of more than 5 watts/cm^2 is provided inside the etching chamber in one of the region near the plasma source and at a location of the substrate.

39. (Currently Amended) The plasma system as recited in Claim ~~32~~ 30, further comprising:

at least two coils externally enclosing the etching chamber and positioned one above the other, the two coils having current flows in opposite directions, wherein the at least two coils are provided between the plasma source and the substrate.

40. (Previously Presented) The plasma system as recited in Claim 34, wherein the etching gas and the passivation gas are used alternately during separate etching steps and passivation steps that are controlled independently of one another, the passivation gas being supplied to the etching chamber substantially only during the passivation steps, and the etching gas being supplied to the etching chamber substantially only during the etching steps.

41. (New) The method as recited in claim 21, wherein the common feed line has a length of less than 20 cm.

42. (New) The plasma system as recited in claim 30, wherein the common feed line has a length of less than 20 cm.